Postoperative Hyperamylasemia vs. Drain Fluid Amylase as Predictors of Pancreatic Fistula After Pancreatic Surgery

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INTRODUCTION

Postoperative pancreatic fistula (POPF) develops in 5–25% of patients after pancreatic resection, leading to major morbidity. Leakage of pancreatic secretions can cause abscesses, sepsis, and prolonged hospital stay. The ISGPS defines POPF as drain fluid amylase (DFA) >3× upper limit of normal (ULN) serum amylase on or after postoperative day (POD) 3. Serum amylase, however, is a simpler, less invasive marker and may predict POPF earlier, even when drains are absent.

METHODS

A prospective cohort of 120 adults undergoing pancreaticoduodenectomy or distal pancreatectomy was studied at Sheikh Zayed Hospital, Lahore (Feb–Aug 2025). Serum amylase and DFA were measured at 24, 48, and 72 hours postoperatively. Clinically relevant POPF (CR-POPF) was defined by ISGPS criteria. Outcomes included drain management, complications, and hospital stay. Data were analysed in SPSS v24 using t-tests, chi-square, and ROC analysis. Cut-offs: serum amylase >110 IU/L; DFA >3× ULN.

RESULTS

Among 120 patients (mean age 55 years; 65% male), 25% developed CR-POPF. Risk was higher after distal pancreatectomy (37.5%) than pancreaticoduodenectomy (18.8%). POPF patients had higher serum amylase (213 vs. 78 IU/L, $p<0.001$) and DFA (1840 vs. 60 IU/L, $p<0.001$). Serum hyperamylasaemia predicted CR-POPF with 83% sensitivity and 72% specificity; DFA showed 100% sensitivity and 89% specificity. ROC curves were comparable (AUC 0.81 vs. 0.85, $p=0.40$). POPF patients had longer hospital stays (15 vs. 8 days) and more infections (50% vs. 10%).

DISCUSSION

Serum amylase demonstrated non-inferior predictive accuracy compared to DFA for CR-POPF. Early hyperamylasaemia (>100 IU/L on POD1) effectively stratified risk. DFA remains specific but depends on drain placement and patency. Serum amylase, easily measurable through routine labs, is a practical alternative when drains are absent. POPF markedly increased hospital stay, infection rate, and reoperation need. Incorporating serum amylase into early postoperative monitoring can improve risk stratification and drain management.

Figure 1: Distribution of POPF Outcomes (n=120)

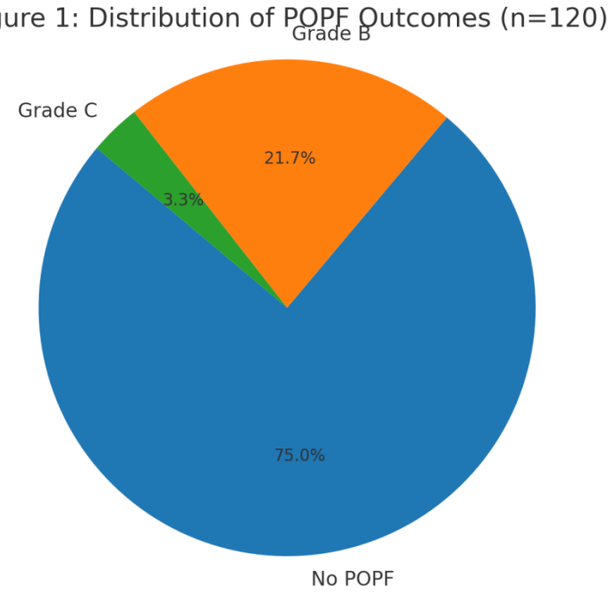

Figure 2: Serum Amylase Trends by POPF Status

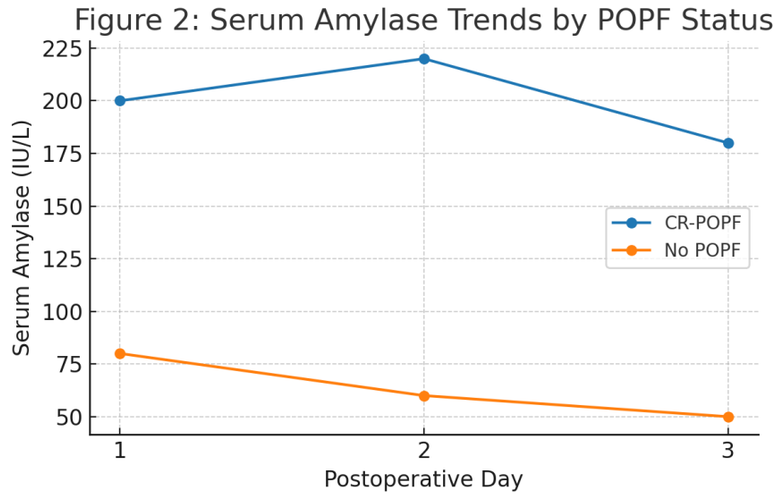

Figure 3: Drain Fluid Amylase Trends by POPF Status

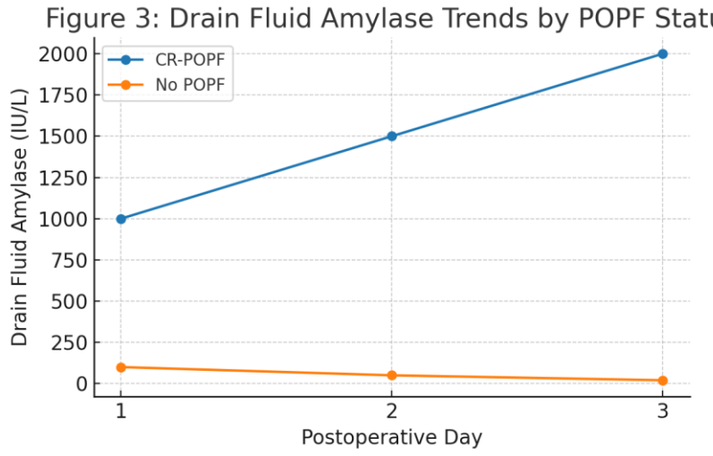

Table : Diagnostic Performance of Postoperative Hyperamylasemia vs. Drain Fluid Amylase for CR-POPF.

Predictor	Sensitivity	Specificity	PPV	NPV
Serum hyperamylasemia (anytime POD0–3)	83.3%	72.2%	50.0%	92.9%
Drain fluid amylase >3× ULN (by POD3)	100%	88.9%	75.0%	100%

REFERENCES

1. Bassi C et al., *J Hepatobiliary Pancreat Sci*, 2020.
2. van Dijk SM et al., *Ann Surg*, 2021.
3. Lee DY et al., *J Gastrointest Surg*, 2021.
4. El Nakeeb A et al., *Int J Surg*, 2020.
5. Mintziras I et al., *Pancreatology*, 2022.
6. Fukada J et al., *World J Surg*, 2023.

Conclusion

Serum hyperamylasaemia is a reliable, non-invasive, and early predictor of postoperative pancreatic fistula. Its diagnostic accuracy parallels DFA, supporting its integration in early postoperative protocols to guide drain removal and targeted monitoring.

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